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ABSTRACT

One of a series of studies examining Louisiana's compensatory education program, this study investigated four assumptions upon which a skill-specific intervention program was based. Framed as questions, these assumptions are: (1) Is retention effective for students who do not know basic content for a given grade level? (2) When is retention most effective among students who fail to meet prescribed minimum performance standards at each grade level? (3) How do students who have not attained minimum skills required at their grade level but who are promoted perform on the next level? (4) Does early identification and skill-specific intervention prevent later difficulties? Data was obtained from elementary school students whose scores in Louisiana's 1982 Grade 2 Basic Skills Testing (BST) program indicated that they were qualified for compensatory education and who were tracked through 1983, 1984, and 1985. In 1983 promoted and retained subgroups emerged in the data, each of which was further divided on the same promoted/retained basis in 1984 and 1985. The report of results includes a summary of 1982-1985 BST attainment rates of initial 1982 qualifiers and a discussion of the effects of retention at various grade levels. Findings suggest that students have fewer difficulties attaining grade-level basic skills when they are both retained and promptly provided remediation. (RH)

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A FOUR-YEAR LONGITUDINAL STUDY OF THE SUSTAINED EFFECTS OF PROMOTION/RETENTION AND SKILL-SPECIFIC INTERVENTION RELATIVE TO IDENTIFIED DEFICIENCIES ON THE PERFORMANCE OF ELEMENTARY STUDENTS

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INTRODUCTION

Over the past 20 years many compensatory education programs have been implemented across the country. Initially, the vast majority were federally funded, but in recent years, the number of state-supported programs has steadily increased. While the specific criteria for participation in such programs vary from state to state, some form of testing is usually involved. At present, all but three states are engaged in state assessment efforts with 38 specifically involved in minimum competency testing (Burnes, 1985).

This study is part of a series of examinations of Louisiana's compensatory education program that have been conducted since the program was first implemented in 1982. Student qualification for the program has been based solely on state test results. The studies have been concerned with the sustained effects of promotion/retention combined with skill-specific intervention relative to the deficiencies identified by the state test. The results to date have indicated that the state's compensatory education program has an identifiable effect on basic skills mastery when the performance of retained students receiving these services is compared with that of students not receiving remedial services and the effect of classroom instruction is controlled (Rachal, 1984). Louisiana has also found that it makes little difference whether compensatory education is provided in summer school or during the regular school year, or whether or not it is accompanied by Chapter 1 remedial instruction that is presumably directed toward the same basic language arts and mathematics skills addressed by the state's compensatory program (Rachal and Hoffman, 1984).

As far as can be determined, Louisiana is the only state requiring that student performance on the statewide minimum competency test be considered in local school districts' promotion/retention decisions. Evaluations of the Louisiana State-Funded Compensatory/Remedial Program have found that the proportion of students retained has increased among the grade levels included in the state minimum competency testing program since it was introduced in 1982, but that districts are still almost as likely to promote as to retain students who do not achieve the identified standards on the tests (Rachal, 1985; Rachal, 1986). This has been explained in part by the limitations most district policies place upon the number of times a student can be retained within the span of the elementary grades. The state test identifies those lowest-performing students who are most likely to have already been retained the maximum number of years allowed. Additionally, the data indicating that students served in summer school perform no better than those receiving remedial services during the regular school year suggest that districts cannot use summer school to correct skills deficiencies and then promote students with confidence that they will not have later difficulties. This finding is in keeping with a study conducted in a large southern school district, in which teachers noted little difference between the performance of retained students who had attended summer school and those who had not (Austin Independent School District, 1983).

Neither retaining students for an additional year of classroom instruction nor providing remedial services in addition to regular instruction is without costs. The present study recognizes that, in Louisiana, elementary students with identified weaknesses in language

arts and mathematics skills may or may not be retained, but will receive state-supported remedial instruction. It addresses the questions of when retention appears to be most effective and whether a combination of repeated classroom instruction and remedial services can ultimately correct such deficiencies.

Louisiana Basic Skills Test and Compensatory Education Program

The Louisiana Basic Skills Testing (BST) program was initiated in the spring of 1982, with criterion-referenced tests of language arts and mathematics administered to all second grade students, regular and special education, who were addressing the state's minimum standards in these subject areas. Students who scored less than 75 percent correct in either subject area were provided with 70 hours of remedial instruction in their identified deficient skills during the 1982-83 school year, or the summer preceding it, through the State-Funded Compensatory/Remedial Program. The third grade was added to the testing and compensatory education program in 1983, the fourth grade in 1984, and the fifth grade in 1985. All students qualifying for compensatory education were provided these services, with instruction limited to deficient skills identified through the grade level BST on which students had been tested. School districts, in accordance with their pupil progression policies, could either promote these students or retain them. In the spring of each year students were tested on the BST appropriate to their enrolled grade levels. Thus, a qualifying student who was retained in the second grade was retested on this same grade level BST after receiving a year of compensatory education in second grade skills. A student promoted to the third grade received a year of

compensatory education in second grade skills along with a year of classroom instruction in third grade skills before being tested on the third grade BST the following year.

There was minimal state control of compensatory education programs at the district level. About half of these programs were seven-week summer schools, and about half were 70 hours of small-group instruction for each subject area in which the student qualified during the regular school year. The regular year instruction was typically provided one hour a day beginning at the start of the school year and using workbooks or teacher-made materials directed toward the deficit skills identified on the BST. Instruction was provided by certified teachers to students generally pulled from the regular classroom for their compensatory education.

Evaluation Questions

Earlier analyses of BST performance had found that retained students participating in the compensatory education program made greater gains than other retained students when initial BST performance differences were controlled. Additional findings revealed that special education as well as regular education students profited from the compensatory education services, and that there were few differences in gains between students served by Chapter 1 teachers or other teachers, or among students served in summer school, during the regular school year, or at both times.

The purpose shared by both the testing and remedial programs is to ensure that students progress through the public school system with a mastery of those basic skills required for successful classroom

performance. Four years of experience with a skill-specific intervention program directed toward providing instruction in identified deficiencies has provided the data to test some of the basic assumptions underlying this purpose. These assumptions, framed as questions, are:

1. Is retention an effective strategy for students who do not know basic content for a given grade level?
2. When is retention most effective among those students who fail to meet the prescribed minimum performance standard at each grade level?
3. How do students who do not have the minimum skills required for one grade level but are promoted perform on the next level?
4. Does early identification and skill-specific intervention prevent later difficulties?

Data Sources

The data for this study were obtained from four years of student-level BST results. The initial group of compensatory education qualifiers identified on the 1982 Grade 2 BST was tracked by computer through the 1983, 1984, and 1984 administrations of the test. The final merged files consisted of only those students for whom the key identifying variables were present for each of the years tested.

From the original 1982 group of compensatory education qualifiers, two subgroups emerged in 1983, based on whether the participants were promoted or retained for the 1982-83 school year. Each subgroup was further divided on the same basis for the 1984 and 1985 administrations of the BST so that eight student groupings eventually resulted.

Data Analysis

This study employed statistical techniques appropriate to the existing data sources to address the four questions of interest. The effect of retention at different grades was examined through analysis of

covariance, comparing the effects of various promotion/retention patterns on subsequent 1985 performance. Two cohorts of students were involved in the study. One group of students was retained twice during the 1982-1985 period and received at least one year of skill-specific instruction. Students within the other group were retained once during that period and also received at least one year of this instruction. Initial 1982 test scores were used as the covariant. The effects of various promotion/retention patterns and of varying numbers of years of skills-specific intervention were compared through analysis of covariance in the 1985 test scores of these two student groups. One group, those retained twice since 1982, took the grade 3 test in 1985; the other, those retained once since 1982, took the grade 4 test. All received at least one year of intervention, but many received one or more years of additional services beyond that first one. The basic skills performance of those students who failed the test but were promoted for the next school year were examined through their mean scores and the proportions of such students attaining the minimum performance criterion on each grade level test.

RESULTS

The effect of the State-Funded Compensatory/Remedial Program on the 1985 language arts and mathematics BST performance of the initial group of language arts qualifiers is shown in Table 1. For each area (language arts and mathematics), the number of students tested (N), the appropriate BST mean score, and the number and percentage of students attaining the minimum standard on the BST are shown by student subgroup.

Table 1. 1985 BST Performance of Regular Education Students Who Initially Qualified for Compensatory/Remedial Services on the 1982 Grade 2 BST

	LANGUAGE ARTS				MATHEMATICS			
		BST	Scored ≥ 75			BST	Scored ≥ 75	
Student Group	N	Mean	N	%	N	Mean	N	%
Ret 83; Ret 84; Ret 85	0	-	-	-	0	-	-	-
Ret 83; Ret 84; Pro 85								
1982 Grade 2 BST	7	56.19	0	0.00	3	35.00	3	0.00
1983 Grade 2 BST	6	87.78	6	100.00	2	86.67	2	100.00
1984 Grade 2 BST	7	95.00	7	100.00	3	96.67	3	100.00
1985 Grade 3 BST	7	77.64	5	71.43	3	81.67	2	66.67
• One year C/R	7	77.64	5	71.43	3	81.67	2	66.67
Ret 83; Pro 84; Ret 85								
1982 Grade 2 BST	90	56.52	0	0.00	67	60.50	0	0.00
1983 Grade 2 BST	90	88.48	84	93.33	66	89.67	64	96.97
1984 Grade 3 BST	90	65.35	31	34.44	67	67.63	20	29.85
1985 Grade 3 BST	89	81.35	71	79.78	66	84.05	57	86.36
• One year C/R	30	87.64	28	93.33	20	87.60	19	95.00
• Two years C/R	54	79.95	42	77.78	44	84.09	38	86.36
• Three years C/R	5	58.70	1	20.00	2	47.50	0	0.00
Ret 83; Pro 84; Pro. 85								
1982 Grade 2 BST	489	61.69	0	0.00	251	63.15	0	0.00
1983 Grade 2 BST	489	93.16	467	95.50	251	92.27	248	98.81
1984 Grade 3 BST	489	84.54	425	86.91	251	82.71	202	80.48
1985 Grade 4 BST	488	78.77	356	72.80	250	77.90	166	66.14
• One year C/R	412	81.06	330	80.10	199	79.87	145	72.50
• Two years C/R	67	68.51	25	36.76	50	70.86	21	42.00
• Three years C/R	9	50.26	1	11.11	1	36.36	0	0.00
Pro 83; Ret 84; Ret 85								
1982 Grade 2 BST	7	65.24	0	0.00	7	67.62	0	0.00
1983 Grade 3 BST	7	50.16	0	0.00	6	56.50	0	0.00
1984 Grade 3 BST	7	66.00	1	14.29	7	63.57	2	28.57
1985 Grade 3 BST	7	85.56	6	85.71	7	80.57	5	71.43
• Two years C/R	1	81.52	1	100.00	3	88.00	3	100.00
• Three years C/R	6	86.23	5	83.33	4	75.00	2	50.00

Table 1 (cont'd)

Student Group	LANGUAGE ARTS N	LANGUAGE ARTS BST Mean	LANGUAGE ARTS Scored ≥ 75 N	LANGUAGE ARTS Scored ≥ 75 %	MATHEMATICS N	MATHEMATICS BST Mean	MATHEMATICS Scored ≥ 75 N	MATHEMATICS Scored ≥ 75 %
Pro 83; Ret 84; Pro 85								
1982 Grade 2 BST	163	62.99	0	0.00	106	66.01	0	0.00
1983 Grade 3 BST	163	63.10	33	20.24	105	63.30	23	21.70
1984 Grade 3 BST	162	84.98	142	87.12	106	84.58	92	86.79
1985 Grade 4 BST	162	77.40	105	64.42	105	77.46	69	65.09
• One year C/R	32	81.88	25	78.13	24	87.69	23	95.83
• Two years C/R	112	78.25	73	65.18	67	76.00	43	63.24
• Three years C/R	18	64.15	7	36.84	14	66.88	3	21.43
Pro 83; Pro 84; Ret 85								
1982 Grade 2 BST	145	62.84	0	0.00	86	65.74	0	0.00
1983 Grade 3 BST	145	68.62	61	42.07	85	70.94	39	45.35
1984 Grade 4 BST	145	63.18	19	13.10	86	66.25	18	20.93
1985 Grade 4 BST	144	77.75	102	70.34	86	83.32	69	80.23
• One year C/R	13	83.42	11	84.62	14	90.34	14	100.00
• Two years C/R	54	83.88	46	85.19	30	85.00	26	86.67
• Three years C/R	77	72.50	45	57.69	42	79.79	29	69.05
Pro 83; Pro 84; Pro 85								
1982 Grade 2 BST	274	63.70	0	0.00	212	65.40	0	0.00
1983 Grade 3 BST	271	79.79	190	69.34	210	76.19	124	58.49
1984 Grade 4 BST	274	79.46	162	59.12	212	79.44	119	56.13
1985 Grade 5 BST	274	72.19	143	52.19	212	74.76	127	59.91
• One year C/R	128	77.42	88	68.75	82	81.26	60	73.71
• Two years C/R	99	69.26	40	40.40	81	73.24	49	60.49
• Three years C/R	47	64.10	15	31.91	49	66.37	18	36.73

Summary of 1982-1985 BST Attainment Rates of Initial 1982 Qualifiers

A summary flowchart of the 1982-85 BST standard attainment rates of regular education students who qualified for compensatory/remedial services in 1982 is presented in Figure 1. The data are drawn from Table 1 and reflect the attainment rates of each of the promoted/retained student subgroups described in that table. The 1985 BST means for each of the subgroups are shown below the final level of the flowchart for language arts (L) and mathematics (M).

As Figure 1 illustrates, among the regular education students who failed to attain the minimum performance standard on the 1982 Grade 2 BST and thus qualified for compensatory/remedial services during the 1982-83 school year, 50 percent were retained in grade 2 for 1982-83, and 50 percent were promoted to grade 3.

Retained 1982-83 Group

During the spring of 1983 the retained group again took the Grade 2 BST. Among those students who had received grade 2 compensatory/remedial services in language arts, 90 percent attained the minimum performance standard on the language arts component of the 1983 Grade 2 BST. Among the recipients of grade 2 services in mathematics, 94 percent attained the minimum standard on the mathematics component.

At the end of the 1982-83 school year, 2 percent of the students who had been retained that year were again retained in grade 2 for 1983-84; the remaining 98 percent were promoted to grade 3.

Promoted 1982-83 Group

Students in the initial qualifying group promoted to grade 3 for

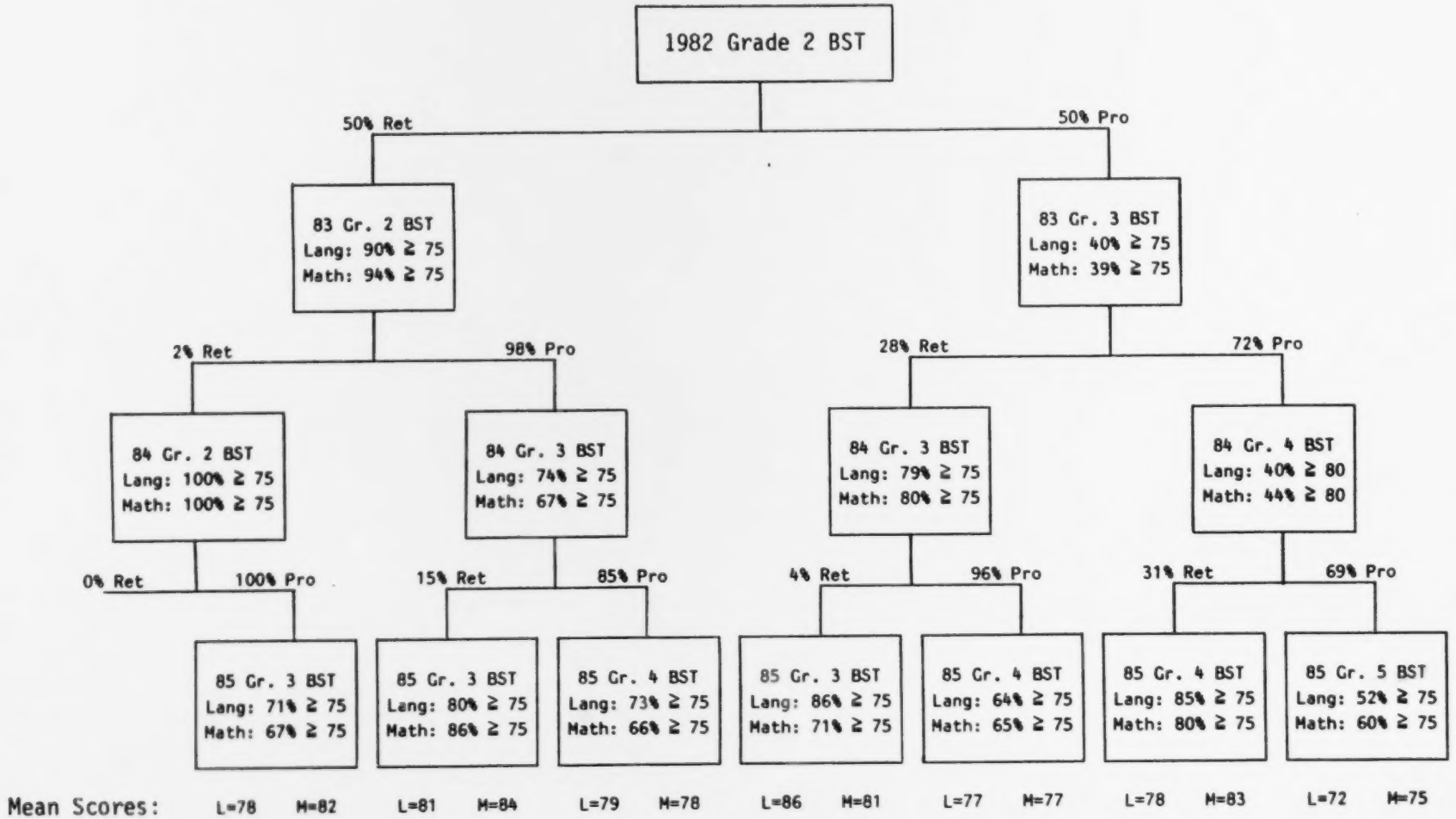

Figure 1. BST Attainment Rates for Initial 1982 Grade 2 Compensatory/Remedial Program Qualifiers

1982-83 received both grade 2 compensatory education and grade 3 regular instruction during that school year. Upon being tested on the Grade 3 BST in 1983, 40 percent of the recipients of grade 2 language arts services attained the minimum standard on the language arts component; in mathematics, 39 percent attained at least the minimum on the mathematics component. In 1983-84, among those students who had been promoted to grade 3 in the previous year, 28 percent were retained in grade 3 for 1983-84, and 72 percent were promoted to grade 4.

Retained 1982-83; Retained 1983-84 Group

The 1984 Grade 2 BST performance of students who had been retained in grade 2 for two successive years is shown in the lower left block of the third level of Figure 1. Among the original 1982 qualifiers for language arts services, all students (100%) attained the minimum on the language arts component of the 1984 test. Performance on the mathematics component was comparable.

Retained 1982-83; Promoted 1983-84 Group

The 1984 Grade 3 BST performance of students who had been retained in grade 2 during 1982-83 and then promoted to grade 3 for 1983-84 is shown in the component of the flowchart labeled "98% Pro." Among the initial language arts qualifiers in this group, 74 percent attained the minimum on the language arts component of the Grade 3 BST; in mathematics, 67 percent attained the minimum.

Promoted 1982-83; Retained 1983-84 Group

The 1984 Grade 3 BST performance of students who had been promoted

to grade 3 during 1982-83 and then retained there for 1983-84 is illustrated in the flowchart component labeled "28% Ret." As illustrated, 79 percent of the initial language arts qualifiers attained the minimum requirement on the language arts component of the 1984 Grade 3 BST. The passing rate among the total group of mathematics qualifiers was 80 percent.

Promoted 1982-83; Promoted 1983-84 Group

The 1984 Grade 4 BST performance of students who had been promoted to grade 3 during 1982-83 and then promoted to grade 4 for 1983-84 is illustrated in the "72% Pro" section of Figure 1. Among the original language arts qualifiers, 40 percent attained the minimum performance standard on the 1984 Grade 4 BST. Among the original mathematics qualifiers, 44 percent attained the minimum.

Retained 1982-83; Retained 1983-84; Retained 1984-85 Group

The fourth level of Figure 1 illustrates the 1985 BST attainment rates of initial 1982 grade 2 compensatory/remedial qualifiers by student group. Among those students who had been retained in grade 2 for both 1982-83 and 1983-84, none were retained for a third time at that level.

Retained 1982-83; Retained 1983-84; Promoted 1984-85 Group

The first complete block shown on the fourth level of Figure 1 illustrates the 1985 Grade 3 BST performance of initial 1982 qualifiers who were retained in grade 2 for two successive years and then promoted to grade 3 for 1984-85. Among the original language arts qualifiers, 71

percent attained at least the minimum performance standard on the language arts component of the 1985 Grade 3 BST. Among the initial mathematics qualifiers, 67 percent attained at least the minimum on the mathematics component.

Retained 1982-83; Promoted 1983-84; Retained 1984-85 Group

Among the initial 1982 qualifiers retained during 1982-83 and then promoted for 1983-84, 15 percent were retained in grade 3 for the 1984-85 school year. The 1985 Grade 3 BST attainment rate for original language arts qualifiers was 80 percent passage; that among original mathematics qualifiers was 86 percent.

Retained 1982-83; Promoted 1983-84; Promoted 1984-85 Group

The other 85 percent of the original compensatory/remedial qualifiers retained in 1982-83 and then promoted in 1983-84, were promoted to grade 4 for 1984-85. The attainment rate of the language arts qualifiers was 73 percent passage on the 1985 Grade 4 BST. Among the initial mathematics qualifiers, 66 percent passed the mathematics component.

Promoted 1982-83; Retained 1983-84; Retained 1984-85 Group

The 1985 BST performance of initial 1982 compensatory/remedial qualifiers promoted to grade 3 for 1982-83 and then retained at that level for two successive years is shown in the section labeled "4% Ret" in Figure 1. Among the initial language arts qualifiers, 86 percent attained at least the minimum performance standard; 71 percent of the initial mathematics qualifiers performed comparably on the mathematics component.

Promoted 1982-83; Retained 1983-84; Promoted 1984-85 Group

Among the 1982 qualifiers who had been promoted to grade 3 for 1982-83 and then retained at that level for 1983-84, 96 percent were promoted to grade 4 for the 1984-85 school year. The 1985 Grade 4 BST attainment rate among the language arts qualifiers was 64 percent on the language arts component; that among the mathematics qualifiers was 65 percent.

Promoted 1982-83; Promoted 1983-84; Retained 1984-85 Group

The 1985 BST performance of initial 1982 qualifiers promoted to grade 3 for 1982-83, promoted to grade 4 in 1983-84, and then retained at that level in 1984-85 is shown in the section labeled "31% Retained." Among the language arts qualifiers, 85 percent passed the language arts component of the 1985 Grade 4 BST. The attainment rate among the initial mathematics qualifiers was 80 percent.

Promoted 1982-83; Promoted 1983-84; Promoted 1984-85 Group

Among the 1982 qualifiers who were promoted to successive grade levels in 1982-83 and 1983-84, 69 percent were promoted to grade 5 in 1984-85. The 1985 Grade 5 BST attainment rate among the language arts qualifiers in this group was 52 percent passage on the language arts component; that in mathematics was 60 percent on the mathematics component.

Overall, 24.84 of the initial 1982 grade 2 compensatory/remedial program qualifiers were never retained during the 1982-1985 period, 66.25 percent were retained once, and 8.91 percent were retained twice. None were retained three times.

Effects of Retention at Various Grade Levels

Grade 3 BST Results

Among the initial 1982 grade 2 compensatory/remedial qualifiers tracked through to the 1984-85 school year, three subgroups were enrolled in grade 3 in 1985 and were thus all tested on the Grade 3 BST during 1985. Students in all three subgroups had been retained twice and promoted once during the 1982-85 span, but the promotion/retention sequence, as well as the number of years of compensatory/remedial services received, varied across the subgroups.

The effects of the varied promotion/retention patterns and the number of years of compensatory/remedial services received by language arts students in the three subgroups on 1985 Grade 3 BST performance were examined through analysis of covariance. Initial 1982 Grade 2 BST scores were used as the covariant. For all analyses, .05 was used as the level of statistical significance. The language arts results are shown in Table 2.

As illustrated, the statistical model incorporating student category (PRR, RPR, or RPP) and number of years of compensatory/remedial services received (one, two, or three) with initial 1982 Grade 2 BST scores as a covariant was found to be significant ($PR < 0.0001$). However, the R-square of 0.2363 indicates that these factors may account for only 23.63 percent of the variation in the 1985 BST scores. The remaining variation must be due to factors not incorporated into the model.

Close examination of the analysis of covariance model revealed significant differences within the main effects of student category ($PR < 0.0007$) and years of compensatory/remedial services received

Table 2. Analysis of Covariance, Language Arts Performance of 1982 Grade 2 Compensatory/Remedial Program Qualifiers Who Took the Grade 3 BST in 1985
N = 101

Source	Degree of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	5	3596.74	719.35	5.88	0.0001*	0.2363
Error	95	11621.26	122.33	-	-	-
Corrected Total	100	15218.00	-	-	-	-
Student Category	2	1926.34	-	7.87	0.0007*	-
Years C/R	2	3212.11	-	13.13	0.0001*	-
82 Grade 2 BST	1	2.59	-	0.02	0.8847	-

Main Effects	No. of Students	82 BST Mean	85 BST Mean	Adjusted 85 BST Mean	Probability Value
Student Category					
a. PRR[1]	7	65.24	85.56	97.43	PRR vs. RPR = 0.0007*
b. RPR[2]	89	56.42	81.35	76.53	PRR vs. RRP = 0.0002*
c. RRP[3]	5	57.00	77.39	66.23	RPR vs. RRP = 0.0573
Years C/R					
a. One	35	59.67	86.18	91.22	One vs. Two = 0.0021*
b. Two	55	55.45	79.78	83.11	One vs. Three=0.0001*
c. Three	11	56.82	73.72	65.85	Two vs. Three=0.0005*

*Denotes significance beyond the .05 level.

[1]Promoted for 1982-83, retained for 1983-84, and then retained again for 1984-85.

[2]Retained for 1982-83, promoted for 1983-84, and then retained for 1984-85.

[3]Retained for 1982-83, retained again for 1983-84, and then promoted for 1984-85.

21A

21B

(PR < 0.0001). Thus, differences in adjusted 1985 BST scores were observed among students in different categories (PRR, RPR, and RRP), and among students who had received varying years of compensatory/remedial services. However, the students' 1982 Grade 2 BST scores did not appear to be strongly related to differences in their 1985 Grade 3 BST language arts performance (PR < 0.8847).

In order to pinpoint the nature of the observed differences, a t-test procedure was used to compare the adjusted 1985 Grade 3 BST means of the students by category (PRR, RPR, or RRP) and by years of services received (one, two, or three). The mean comparisons by student category indicated that, once initial differences in 1982 Grade 2 BST scores were accounted for, the PRR students significantly outperformed both the RPR (PR < 0.0007) and the RRP groups (PR < 0.0002) on the 1985 Grade 3 BST. It must, however, be noted that students in this PRR group were completing their third year of grade 3 instruction and were being tested on the Grade 3 BST for the third time. Comparisons of adjusted 1985 BST performance by years of services received indicated that the one-year recipients scored significantly higher than the other two groups, and that two-year recipients outscored those who had received three years of services.

A similar analysis of covariance model was used to compare the 1985 Grade 3 BST mathematics performance of the three student subgroups who had initially qualified for mathematics services in 1982 and who were in grade 3 in 1985. The results of the analysis are shown in Table 3. The overall model was significant (PR < 0.0006) with the R-square value being 0.2673. Among the two main effects examined in the model, only years of compensatory/remedial services received was found to be

Table 3. Analysis of Covariance, Mathematics Performance of 1982 Grade 2 Compensatory/Remedial Program Qualifiers Who Took the Grade 3 BST in 1985
N=75

Source	Degree of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	5	3188.58	637.72	5.04	0.0006*	0.2673
Error	69	8738.16	126.64	-	-	-
Corrected Total	74	11926.75	-	-	-	-
Student Category	2	469.73	-	1.96	0.1485*	-
Years C/R	2	2215.32	-	8.75	0.0004*	-
82 Grade 2 BST	1	285.94	-	2.26	0.1375	-

Main Effects	No. of Students	82 BST Mean	85 BST Mean	Adjusted 85 BST Mean	Probability Value
Student Category					
a. PRR	7	67.62	80.57	85.96	PRR vs. RPR = 0.1240
b. RPR	66	60.45	84.05	76.97	PRR vs. RRP = 0.0615
c. RRP	2	59.17	76.00	66.41	RPR vs. RRP = 0.2116
Years C/R					
a. One	22	63.86	86.55	86.42	One vs. Two = 0.3487
b. Two	47	59.86	84.34	83.49	One vs. Three=0.0001*
c. Three	6	60.56	65.83	59.42	Two vs. Three=0.0001*

*Denotes significance beyond the .05 level.

significant (PR < 0.0004). In adjusted 1985 Grade 3 BST performance, students who had received either one or two years of compensatory/ remedial services were found to perform significantly better than three-year service recipients.

Grade 4 BST Results

Among the initial 1982 Grade 2 compensatory/remedial qualifiers three subgroups emerged, all of which were tested on the Grade 4 BST in 1985. An analysis of covariance procedure was again used to compare the 1985 Grade 4 BST performance of these students by student category and by years of services received with initial 1982 Grade 2 BST scores again used as the covariant. The language arts results are shown in Table 4.

As illustrated, the overall model was significant (PR < 0.0001); the R-square value was 0.1852. The two main effects as well as the covariant were all found to be significant (PR < 0.0001 for all). When adjusted 1985 Grade 4 BST means were compared by student category, the subgroup PPR was found to have outperformed both the PRP (PR < 0.0003) and the RPP (PR < 0.0001) subgroups. It must again be noted that the PPR students were completing their second year in grade 4 and were being tested on the Grade 4 BST for the second time. The PRP students outscored the RPP subgroup (PR < 0.0129). Significant differences also were found among the one-, two-, and three-year service recipients with the one-year recipients outperforming both the two- and three-year service recipients. The two-year students also outscored those who had received three years of services (PR < 0.0001 for all comparisons). The results of the analysis of covariance model used to compare the 1985 Grade 4 BST performance of the initial 1982 mathematics qualifiers are

Table 4. Analysis of Covariance, Language Arts Performance of 1982 Grade 2 Compensatory/Remedial Program Qualifiers Who Took the Grade 4 BST in 1985
N=791

Source	Degree of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	5	30820.42	6164.98	35.69	0.0001*	0.1852
Error	785	135583.15	172.72	-	-	-
Corrected Total	790	166403.57	-	-	-	-
Student Category	2	5340.92	-	15.46	0.0001*	-
Years C/R	2	14686.48	-	42.52	0.0001*	-
82 Grade 2 BST	1	8753.83	-	50.68	0.0001*	-

Main Effects	No. of Students	82 BST Mean	85 BST Mean	Adjusted 85 BST Mean	Probability Value
Student Category					
a. PPR	144	62.85	77.75	81.53	PPR vs. PRP = 0.0003*
b. PRP	160	63.20	77.19	75.49	PPR vs. RPP = 0.0001*
c. RPP	487	61.83	78.80	71.78	PRP vs. RPP = 0.0129*
Years C/R					
a. One	456	63.34	81.22	84.80	One vs. Two = 0.0001*
b. Two	231	61.33	76.61	77.39	One vs. Three=0.0001*
c. Three	104	59.84	69.13	66.61	Two vs. Three=0.0001*

*Denotes significance beyond the .05 level.

shown in Table 5. As was the case among language arts qualifiers, the mathematics model was significant (PR < 0.0001); the R-square value was 0.1811. The main effects of student category and years of C/R as well as the covariant (82 Grade 2 BST scores) were all significant. Examination of the adjusted 1985 Grade 4 BST scores indicated that the PPR subgroup outperformed both the PRP (PR < 0.0015) and the RPP (PR < 0.0001) subgroups, while the PRP subgroup outscored students in the RPP subgroup (PR < 0.0445). Again, the combined effects of retention in grade 4 and repeated testing on the same BST may have accounted for the observed results. The one-year service recipients were found to have outperformed the students who had received two or three years of services (PR < 0.0001 in each case), and the two-year recipients outscored those who had received three years of services (PR < 0.0119).

DISCUSSION OF THE RESULTS

Among the students who first qualified for the State-Funded Compensatory/Remedial Program through the 1982 Grade 2 BST and for whom four years of longitudinal data were available, several observations can be made. Students within this group who were retained during 1982-83 received both compensatory/remedial instruction in their deficient grade 2 skills and repeated classroom grade 2 instruction. When retested on the Grade 2 BST in 1983, approximately 92 percent passed the exam. By 1985, 74 percent of the students in this group who were initially retained needed no compensatory education beyond that first year.

However, among the initial 1982 qualifiers who were promoted to grade 3 in 1982-83 and who had received compensatory/remedial services

Table 5. Analysis of Covariance, Mathematics Performance of 1982 Grade 2 Compensatory/Remedial Program Qualifiers Who Took the Grade 4 BST in 1985
N=267

Source	Degree of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	5	8337.97	1667.59	11.55	0.0001*	0.1811
Error	261	37693.39	144.42	-	-	-
Corrected Total	266	46031.36	-	-	-	-
Student Category	2	3256.37	-	11.27	0.0001*	-
Years C/R	2	5623.77	-	19.47	0.0001*	-
82 Grade 2 BST	1	1379.87	-	9.55	0.0022*	-

Main Effects	No. of Students	82 BST Mean	85 BST Mean	Adjusted 85 BST Mean	Probability Value
Student Category					
a. PPR	39	63.85	80.77	84.60	PPR vs. PRP = 0.0015*
b. PRP	50	63.90	75.55	74.99	PPR vs. RPP = 0.0001*
c. RPP	178	61.90	77.43	70.42	PRP vs. RPP = 0.0445*
Years C/R					
a. One	160	62.71	80.33	85.73	One vs. Two = 0.0001*
b. Two	74	62.27	73.31	76.06	One vs. Three=0.0001*
c. Three	33	62.47	73.66	68.22	Two vs. Three=0.0119*

*Denotes significance beyond the .05 level.

in grade 2 skills concurrently with grade 3 regular instruction during that year, only 40 percent were successful on the 1983 Grade 3 BST. Furthermore, when tracked to 1985, only 29 percent of these students had required only a single year of compensatory education to that point; the other 71 percent had received two or three years of services by 1985. These results indicate that, at least in number of years of compensatory/remedial services ultimately required, retention immediately following failure on a BST is more advantageous than promotion.

When these initial 1982 program qualifiers were tracked to 1985, the performance comparisons among students tested on the same grade levels of the BST in 1985 yielded consistent results. Among the three subgroups who took the grade 3 BST in 1985 (all of whom had been retained twice since 1982), the performance of students initially promoted to grade 3 and then retained twice in that grade was found to be the best. However, all of the students in this highest group had received more than a single year of remedial services, meaning that they had failed the BST at least one more time since their initial failure in 1982. Among the initial qualifiers who took the Grade 4 BST in 1985 (all of whom had been retained once since 1982) those who had been promoted twice and then retained in grade 4 outperformed the others. However, 87 percent of these students had received two or three years of remedial services.

These findings are not so contradictory as they appear on the surface. Students who are retained in a grade and who receive compensatory education in the skills for that grade do better than others when they are retested on the same level of the BST. However,

students who are retained as soon as the BST identifies weaknesses in the basic skills are less likely to fail the BST and require remedial assistance in the future.

When the effect of years of compensatory/remedial services was examined apart from the effect of promotion or retention, students who had received only one year of services consistently outperformed the two-year and three-year recipients on the 1985 BST. Thus, considered alone, these results appear to contradict the earlier findings in that they seem to indicate that the fewer the number of years of compensatory/remedial services received, the better the basic skills performance of program participants. However, the lack of consistency between these results and those observed when years of services were considered in combination with promotion/retention sequence, underscores the impossibility of separating the effect of these two factors. Neither, taken alone, appears to be of sufficient strength to produce a consistent, measurable impact on subsequent BST performance. Finally, the statistical tests showed that only a small amount of the variation in students' 1985 BST scores could be explained by the amount of remediation students had received or the number of years they had been retained. Factors other than those examined had a considerable role in determining BST performance.

Among all 1982 qualifiers tracked to 1985, almost half required at least one additional year of compensatory/remedial services beyond the initial 1982-83 year. However, approximately 25 percent of the 1982 qualifiers had never been retained during the 1982-85 period, 66 percent had been retained once during that time, and 9 percent had been retained twice. These longitudinal data on students' chances of passing the BST,

when coupled with information about their scores on the most recent administration of the test, point to several possible forces in operation. Performance can be affected by recency of instruction (hence the advantage to students who have been retained in the grade tested in 1985), by compensatory education services, or by some other unidentified advantage accruing to early retention--perhaps maturation or the opportunity to develop basic skills early rather than struggling through several years of school before problems are corrected.

The structure of the compensatory education program makes it impossible to test these effects separately. Students who fail the BST must be provided remedial education; the decision to promote or retain a student is a local option; and the subsequent BST administered to the child is the one appropriate to his or her grade, not necessarily the one that was failed earlier. However, without the ability to control the treatment combinations administered to different students, the bulk of the evidence discussed in this paper still points to the most effective combination of services. Students appear to have considerably fewer difficulties with grade-level basic skills when they are both retained and provided remediation as soon as inadequate basic skills performance is noted. This finding is consistent with earlier evaluations of Louisiana's State-Funded Compensatory/Remedial Program, and the evidence for it is stronger when based upon four years of data for participating children.

SUMMARY

The findings reached in this study can be summarized as presented below:

- Regardless of whether students are retained after the first or second time they fail the BST, retention has a stronger effect on student performance on the very next BST than it does on later tests. In almost every case the best 1985 BST performance was observed among students who had most recently been retained and had thus received an additional year of classroom instruction in the skills measured by the 1985 BST.

- Students who are retained immediately after their initial failure on the BST require fewer years of remedial services in the future. In looking at students who failed the 1982 BST and who were retained in 1982-83, one finds that about 74 percent did not fail the BST again during the four years that were studied. In contrast, among the students who failed the 1982 BST and were promoted, 71 percent had failed the BST at least one more time by 1985.

  While the two findings above may seem somewhat contradictory, a little reflection shows that, in actuality, they simply display two different aspects of the retention and remediation effect. Students who were retained (many of whom also received compensatory education) in 1984-85 had the highest scores of all groups on the 1985 BST: these students had just completed at least two years of instruction in the skills upon which they were tested. Students who were retained upon failing the BST in 1982 did not necessarily have the highest 1985 BST scores, but they were less likely to have a history of repeated BST failures. Thus, in order to both improve future performance and lessen the likelihood that a student will fail to attain the minimum standards in the future, retention as soon as basic skills problems are identified appears to be more effective.

- When students who first qualified for remedial services in 1982 were examined, those who had received only one year of program services outperformed those who had received two or three years. This could be the result of two factors acting singly or in combination. First, it could reflect the effectiveness of early remediation (particularly when this is coupled with retention). Second, it could measure student ability, on the argument that repeated BST failure identifies less able students.

EDUCATIONAL IMPORTANCE OF THE STUDY

States are continuing to use considerable educational resources for accountability programs measuring student mastery of basic skills. When remedial services, which are recognized as a necessary complement to this testing, are added, the cost becomes even higher. Continued support of state testing and remedial programs cannot be expected to continue without information about the effectiveness of these programs in improving student performance. This study provides such information. And, while it is limited to a single state, the testing and remedial programs, skills addressed in the elementary grades, and analytical procedures are generic enough to serve as models for other states.

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